

REMARKS

Applicant thanks the Examiner for the detailed analysis and remarks. Claims 1-16 remain pending in this application.

Claims 1-3, 5, 7-9 and 12-14 were rejected as being obvious over the Shashua (U.S. 5,821,943) as modified in view of the IEEE paper authored by Park. Claim 1 requires an image processor that breaks a 2D image into geometric elements and matches scanned 3D images with the geometric elements to generate a model of an object. Claim 9 requires the steps of breaking a 2D image into geometric elements and matching a 3D image to the geometric elements to generate the model of the object.

No reason has been identified by the Examiner as to why a person of ordinary skill in the art would make the proposed combination. The Examiner has merely stated that such a combination is prima facie obvious. The passage in Park referenced by the Examiner simply provides a description of uses of structured light scanners, but does not provide any reason as to why anyone would make the proposed combination. It remains necessary for the Examiner to identify a reason for the proposed combination to support a proper prima facie case of obviousness. For this reason the proposed combination is improper and should be withdrawn.

Further, both the Park system and the Shashua system disclose methods of generating a 3D image from 2D data. In the Park system this is accomplished with the aid of lines projected onto an object. In the Shashua system the 3D image is obtained from several different 2D images. Accordingly, the two systems both perform the same function (generating a 3D image), and therefore such a combination would not provide any benefit to the other. In other words, both the Park and Shashua solve the problem of generating a 3D image from 2D images utilizing very different methods, and therefore teach away from the proposed combination. A worker skilled in the art would not develop a system using various 2D images at different angles as in the Shashua system, and then add a system as disclosed in Park using one camera and projected lines on the object. Only one or the other would be utilized, not a combination of both.

Additionally, all that either Park and Shashua disclose is the creation of a 3D image. Both claims 1 and 9 require the creation of a 3D image, but also require the additional step of matching the 3D image with geometric elements of a 2D image. The disclosures of Park and Shashua do not disclose and cannot suggest this step and feature. Instead, both the Park and Shashua systems and methods conclude upon generating a 3D image. As the ultimate goal of Park and Shashua are

to generate a 3D image, the additional claimed steps of claims 1 and 9 cannot be disclosed or suggested. Accordingly, as the proposed combination cannot disclose or suggest all the claimed features and steps, this rejection should be withdrawn.

Further, neither, Park or Shashua disclose matching scanned 3D data to geometric elements obtained from a 2D image. Further, Shashua does not disclose breaking the 2D image into geometric elements as argued by the Examiner. The Examiner argues that the term “geometric level” discussed in col 5, lines 55-60 of Shashua discloses this feature. However, as is defined in Shashua the “geometric level” term is merely a relation between locations and features. This is not the same as the claimed breaking of the 2D image into geometric elements. Accordingly, the proposed combination is improper for failing to disclose or suggest all the claimed features and should be withdrawn.

Additionally, Shashua discloses a method and system for generating 3D object data from 2D projections. Park discloses a dual beam structured light scanner for generating coordinates in 3 dimensions. However, neither Shashua or Park disclose or suggest combining a geometric element from a 2D image with a 3D image. In fact, the disclosures in Shashua teach away from use of a 3D scanned image.

Shashua discloses a method of utilizing 2D data to generate a 3D image. The methods discussed in Shashua make no mention of scanning or of the projection of lines onto an object. In fact one use envisioned by the Shashua system is of map making from aerial or satellite photographs. As appreciated, such a use would not envision or utilize scanning by projecting lines across an object as is described in Park. Applicant recognizes that other uses described in Shashua include 3D modeling of objects and reverse Engineering. However, the same system is envisioned for application both in the map making and reverse engineering and therefore would teach away from a combination with scanning. For the reasons discussed above, the proposed combination of Shashua and Park is improper, and Applicant respectfully requests withdrawal of this rejection.

Claim 4 was rejected as being obvious over Shashua in view of Park and Nasar et al. (U.S. 5,144,685). Claim 4 requires a processor for matching a 3D image with geometric elements of a 2D image. For the reasons discussed above with regard to claims 1 and 9, this feature cannot be suggested or disclosed by the proposed combination. Even though Naser may disclose a processor, it cannot disclose a processor that performs the function as claimed.

Claims 6 and 11, were rejected as being obvious over Shashua in view of Park and Migdal. (U.S. 5,995,650). Claims 6 and 11 are dependent upon an allowable base claim and are therefore also in allowable form.

Claim 15 was rejected as being obvious over Shashua in view of Park and Horikawa et al. (U.S. 4,638,156). Claim 16 was rejected as being obvious over Shashua in view of Park and the thesis by Fabio. Claims 15 and 16 both depend from claim 9 that is allowable form. Accordingly, claims 15 and 16 are also in allowable form.

Thus, claims 1-16 are in condition for allowance. No additional fees are seen to be required. If any additional fees are due, however, the Commissioner is authorized to charge Deposit Account No. 21-0279, in the name of United Technologies Corporation, for any additional fees or credit the account for any overpayment. Therefore, favorable reconsideration and allowance of this application is respectfully requested.

Respectfully Submitted,

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